TECHNOLOGY AND THE 21ST CENTURY BATTLEFIELD: RECOMPLICATING MORAL LIFE FOR THE STATESMAN AND THE SOLDIER

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FOREWORD

Earlier in this century, George Orwell, in his novel, *1984*, offered a vision of the world where the logical might be illogical, right could be wrong, and 2 plus 2 might equal 5. Now that we are beyond 1984 and at the end of the century, humanity faces a future where a millennium of norms established by custom and law may be altered by the implementation of new technologies. As in the Orwellian world of 1984, what seems to be may not be, and what was intended for good could become bad.

In this monograph, Air Force Colonel Charles Dunlap starts from the traditional American notion that technology might offer a way to decrease the horror and suffering of warfare. He points out that historically this assumption is flawed in that past technological advances, from gunpowder weapons to bombers, have only made warfare more—not less—bloody. With a relentless logic, Colonel Dunlap takes to task those who say that the Revolution in Military Affairs has the potential to make war less bloody.

He covers the technological landscape from precision-guided munitions and Information Warfare to the use of space for military operations to raise issues that could pose difficult ethical, legal and moral problems for statesmen and soldiers. Some of these conundrums are so confounding that the author could claim that in all humility his only purpose was to raise these issues to prompt debate. But Colonel Dunlap takes the next step to outline several broad thematic avenues that may help us all address the difficult problems that lie ahead. The issues are important and what follows in this monograph invites discourse. I am sure Colonel Dunlap joins me in welcoming you to that discussion. Let me urge you to indulge yourself in *Technology and the 21st Century Battlefield*.

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TECHNOLOGY AND THE 21ST CENTURY BATTLEFIELD: RECOMPLICATING MORAL LIFE FOR THE STATESMAN AND THE SOLDIER

> So by the benefit of this light of reason, they have found out Artillery, by which warres come to a quicker ends than heretofore, and the great expence of bloud is avoyed; for the numbers slain now, since the invention of Artillery, are much lesse than before, when the sword was the executioner.
>
> John Donne, 1621

Introduction.

To a French Foreign Legionnaire reeling under murderous Viet Minh bombardments at the siege of Dien Bien Phu, the notion that the advent of artillery would diminish the carnage of war would seem to be the cruelest—and most preposterous of ironies.[1] Yet not uncommonly the introduction of new military technology is accompanied by enthusiastic predictions that the savagery of war will somehow be mitigated. All too often, however, these promises remain unfulfilled. Consider, for example, the widely held 17th century belief that the invention of gunpowder made war "less horrible."[2]

Such is the faith in scientific progress. In truth, technological advances bear great responsibility for the exponential growth in the sheer destructiveness of war.[3] Furthermore, as the grim statistics of modern conflicts amply demonstrate,[4] much of that destructiveness falls not just upon belligerent armies and their weaponry, but increasingly upon noncombatants and their property.

Today we are once again seeing renewed optimism that technology might yet provide relief from the nightmare of war. Recent scientific developments raise hopes that 21st

century warfare—if not avoided altogether—might nevertheless be waged in a more humane manner. Much of this optimism is traceable to the Gulf War where the application of high technology seemed to minimize allied and Iraqi casualties alike. Key to this new perception of war were the widely televised images of precision-guided munitions (PGMs).[5] The hopes those pictures evoked are exemplified by the comments of authors George and Meredith Friedman in their book, *The Future of War:*[6]

> The accuracy of *PGM[s] promises to give us a very different age; perhaps a more humane one*. It is odd to speak favorably about the *moral character of a weapon*, but the image of a Tomahawk missile slamming precisely into its target when contrasted with the strategic bombardments of World War II does in fact contain a deep moral message and meaning. War may well be a ubiquitous part of the human condition, but war's permanence does not necessarily mean that the slaughters of the twentieth century are permanent.[7]

To many, PGMs are not the only means of fulfilling the dream of more humane war. The advocates of "information operations"[8] and cyberwar[9] contend that 21st century conflicts can be fought virtually bloodlessly in cyberspace. In a cyberwar scenario depicted in a 1995 *Time* magazine article, a United States Army officer conjured up a future crisis where a technician ensconced at a computer terminal in the United States could derail a distant aggressor "without firing a shot" simply by manipulating computer and communications systems.[10] Likewise, the proponents of a growing plethora of "nonlethal"[11] technologies argue that a range of adversaries can be engaged without deadly effect.

Collectively, most experts believe these innovations reflect an ongoing "revolution in military affairs" (RMA). The RMA seeks to produce radically more effective—and, as the Friedmans indicate, more humane—militaries by profoundly altering their doctrine, organization, and weaponry through the widespread application of emerging microchip-based technologies, especially advanced computer and communications systems.[12] Many observers

believe that the RMA will give the United States a virtually insurmountable military advantage for the foreseeable future.[13]

The impetus to seek technological solutions to virtually every human dilemma—even the costly viciousness of war—is quintessentially American.[14] "Yankee ingenuity" has long sought to substitute machines for manpower.[15] Unsurprisingly, therefore, the United States has enthusiastically embraced the RMA; technology has rapidly become the cornerstone of America's military planning. The former Chairman of the Joint Chiefs of Staff declared that his 1996 directive, *Joint Vision (JV) 2010*,[16] furnishes "an operationally based template"[17] as to "how America's armed forces will channel the vitality and innovation of our people and *leverage technological opportunities to achieve new levels of effectiveness* in joint warfighting."[18]

All of this would seem to bode well for those concerned with the ethical conduct of war. But are new technologies unqualified virtues? In *Why Things Bite Back: Technology and the Revenge of Unintended Consequences*, author Edward Tenner reminds us that technological "advances" have the nasty habit of surprising us with unexpected adverse qualities once their full import is experienced.[19] Well-intentioned efforts can paradoxically create problems worse than the ones a specific invention was meant to solve. Even generally favorable scientific developments frequently manifest "revenge effects" which at best "recomplicate" a particular task or situation.

This monograph seeks to examine the moral conundrums that 21st century statesmen and soldiers may face by identifying some of the ethical issues that are generated or, as Tenner might put it, "recomplicated" by technological advances. Doing so will necessarily involve assessing the impact of high-tech war on the existing law of armed conflict (LOAC).[20] The monograph contends that there is a direct relation between ethics and LOAC. As Geoffrey Best insists, "[I]t must never be forgotten that the

law of war, wherever it began at all, began mainly as a matter of religion and ethics . . . It began in ethics and it has kept one foot in ethics ever since."[21] As a result, this monograph will try to show where international law, which should reflect at least minimum standards of ethics and morality, needs reexamination because of the new technologies of war.

Neither ethics nor law, however, can answer all the questions that may arise on 21st century battlefields. Very often *policy* addresses the many gray areas that ethics and law do not necessarily enlighten—let alone resolve. Policy is critical because even where a particular course of action is technically moral and legal, there remains the important question of *perceptions*. Perceptions can materially affect the public support that military operations conducted by democracies require. Professors W. Michael Reisman and Chris T. Antoniou explain:

> In modern popular democracies, even a limited armed conflict requires a substantial base of public support. That support can erode or even reverse itself rapidly, no matter how worthy the political objective, if people *believe* that the war is being conducted in an unfair, inhumane, or iniquitous way.[22]

In developing policy for 21st century statesmen and soldiers, leaders must deal with two related aspects of post-Vietnam and post-Gulf War America. The first is the growing aversion in both the electorate *and* in the uniformed ranks toward incurring virtually *any* friendly casualties in many military operations.[23] The second, which William Boyne points out "is unusual in history,"[24] requires wars to be won with "a minimum number of casualties inflicted on the *enemy*."[25] The rapid end to the Gulf War following televised pictures of the so-called "Highway of Death" illustrates the new ethical and political perceptions that can influence policymakers.

Of course, this monograph does not purport to address every, or even most, of the challenges of ethics, law, and policy produced by high-technology war. Moreover, even

where the issues that could recomplicate moral life for 21st century statesmen and soldiers are described, solutions are seldom supplied. Rather, if this essay succeeds, it will pose questions that, in turn, may suggest areas worthy of further study. With this in mind, let us return to PGMs, perhaps the most ready example of the unexpected conundrums of high-tech war.

Selected Recomplicating Issues.

Precision Guided Munitions.

As already indicated, PGMs[26] are considered by many as a key to more humane warfare. *JV 2010* touts "precision engagement" as a means to "lessen risk to [United States] forces, and [to] minimize collateral damage."[27] PGMs aim to diminish the horror of war not only because they reduce collateral damage, but also because their accuracy decreases the number of attackers required to go in harm's way to strike a given target.[28] PGMs fulfill many traditional legal and moral norms by providing a greatly enhanced capability to limit the application of force to belligerent militaries and those implements of war whose destruction is mandated by military necessity.[29] In short, unlike other high-tech armaments (e.g., nuclear weapons) that provide military advantages but political liabilities, PGMs uniquely seem to offer both military efficiency and an unparalleled opportunity to seize the moral high ground so conducive to maintaining the necessary public support for military operations.

What then might be the recomplicating effects of their use? One of these is occasioned by the unpredictability of the enemy response. Among other things, we cannot expect future adversaries to be "grateful" that the United States used "humane" PGMs against them. The February 1997 issue of *Air Force Magazine* reports a startling illustration of how one potential opponent might react:

> Many Russian military theorists believe nuclear weapons provide the best answer to the challenge posed by conventionally armed precision guided munitions, which have become such an important part of Western military strategies. Russian generals fear that, in a general war, Western nations could employ such "smart munitions:" to degrade Russian strategic forces, without ever having to go nuclear themselves. Consequently, said General Volkov, Russia "should enjoy the right to consider the first [enemy] use of precision weapons as the beginning of unrestricted nuclear war against it." [30]

While the risk of nuclear holocaust might be an extreme example of an unintended consequence of PGM use, there are plenty of more conventional results of great concern. For example, it has been received wisdom since the Gulf War that Iraq's firing of Kuwaiti oil fields was a monstrous environmental crime.[31] Yet the fact remains, Professor Michael Schmitt acknowledges, that "[I]t could be argued that the fires were intended to take advantage of 'weaknesses' in high-tech Coalition weapons. . . . [S]moke can foil guided munitions. Consider the difficulty, for example, of using an electro-optical guided weapon on a smoke-covered target."[32] As a matter of fact, the fires' smoke *did* degrade the effectiveness of PGMs as well as coalition intelligence-gathering satellites.[33] Authors Michael R. Gordon and General Bernard E. Trainor argue that the Iraqis torched the Kuwaiti oil fields to "erase the American's high-tech advantage."[34] Indeed, the Iraqis were able to launch one of their few offensive actions when an armored formation emerged from the smoke of the burning Burqan oil fields and struck U.S. Marines early in the ground war.[35]

As the Iraqi actions suggest, the use of PGMs might well drive adversaries—especially in less-developed nations—to employ pernicious methodologies to counteract them. It is possible, therefore, that PGM use in certain instances may render the war more, not less, destructive. If a belligerent is attacked with high-tech systems against which it lacks the ability to resist or respond in kind, does it not have the right to respond with whatever resources it has available?[36] Just because a country has the resources to develop and deploy

high-tech weaponry does not *ipso facto* endow it with moral superiority over economically inferior opponents. Moreover, sheer destructiveness does not make a specific method of warfare necessarily illegal so long as the requisites of the law of armed conflict are observed.

But it is also evident that when accepted methods of defense against bombardment, such as hardening and battlefield dispersal, are circumvented, at least to some extent, by the deadly accuracy of PGMs, frustrated defenders may resort to conduct clearly in violation of international norms. One such behavior may have been inspired by an unintended consequence of the Gulf War use of PGMs to destroy the Al Firdos bunker in Baghdad. Unbeknownst to coalition targeteers, that command and control facility was also being used as a shelter by the families of high Iraqi officials. The broadcast of pictures of bodies being pulled from the wreckage caused U.S. leaders—concerned about adverse public reaction to the noncombatant deaths—to virtually end further attacks on the Iraqi capital.[37] Though the decision to forego strikes on Baghdad had little effect on the outcome of the war, the *precedent* is important in the context of Tenner's "recomplicating" effect thesis. The U.S. response to the unexpected results of the Al Firdos bombing could suggest to some opponents a reliable (albeit unconscionable) method of defending against PGM attacks: cover the target with noncombatants.[38]

Such brute behavior creates complications for high-minded U.S. forces. As *JV 2010* asserts, "high ethical standards" are central to the American military ethos.[39] This fact, however, makes them vulnerable to tactics that aim to manipulate their innate respect for human life. For example, using human shield tactics enabled the Serbs to discourage PGM strikes by U.S. and other NATO planes by the simple expedient of chaining captured U.N. troops to potential targets.[40] Other nations can be similarly affected by the exploitation of noncombatants. During the war in Chechyna, for example, insurgents offset their techno-

logical inferiority by threatening civilian hostages to force the Russians to meet various demands.[41]

Several potential U.S. adversaries appear prepared to use noncombatants to blunt the power of high-tech weaponry. Libya threatened to surround the reported site of an underground chemical plant with "millions of Muslims" in order to ward off attacks.[42] Most recently, when Western military action seemed imminent, Saddam Hussein inundated his palaces and other buildings with noncombatant civilians (some of whom may have genuinely volunteered) in order to discourage PGM attacks by Western forces sensitive to the effect on their publics of civilian deaths, regardless of the circumstances.[43]

All of this suggests that PGMs are no panacea. The expectations of decisionmakers that their employment will reduce the dangers to noncombatants may be frustrated; indeed, noncombatants could—paradoxically—be placed at *greater* risk by PGM use in some instances. In truth, the inclination of unscrupulous foes who are determined counter technologically superior U.S. forces to revive the age-old strategy of human shields may herald a new era of barbarism in warfare. In commenting on the actions of Somali warlords who used human shields, James F. Dunnigan ominously warns that "[i]f the opponents are bloody-minded enough, they will always exploit the humanitarian attitudes of their adversaries."[44]

Along these lines, technology itself may provide another recomplicating effect: In order to avoid the effects of PGMs, new communications technology—which *JV 2010* says is already available—will allow an unprecedented level of dispersal of military forces. Dispersal is a way to reduce PGM efficiency—and one that experts assert is militarily *imperative* for those wishing to confront an information-superior opponent like the United States.[45] Dispersal presents a number of recomplications. Among other things, adversaries can employ inexpensive communications devices to so disperse their forces (e.g., create "virtual"

command posts rather than the fixed nodes which optimize PGM efficiency) that the United States will be forced to use costly[46]—and limited—stocks of PGMs against small targets, many of which will be individually expendable. As yet another form of the "human-shield" tactic, an enemy can further complicate targeting solutions by *intentionally* dispersing into *civilian* areas.

Another way of obviating the effects of PGMs is to move into complex terrain, especially jungles, forests and urban areas. Laser and electro-optically guided munitions will not track targets through foliage. In urban areas, even the extreme accuracy of PGMs may not be adequate to prevent civilian casualties.Even the most advanced PGMs will likely cause unintended noncombatant casualties when used in densely populated areas.[47]

Noncombatants and Noncombatant Objects.

Dispersing combatants and military objects into the civilian community is offensive to international law because it violates the principle that defenders have an obligation to separate military targets from civilians and their property.[48] Iraq was rightly criticized for purposely ignoring this tenet during the Gulf War.[49] But as societies become increasingly technologically integrated and, more importantly, *dependent* upon technology, separating military and civilian facilities becomes immensely more complicated, even for morally conscious statesmen and soldiers.

Largely due to budgetary pressures, the United States itself can no longer afford to maintain very many high-tech capabilities separate from those found in the civilian sector (where the cutting-edge technology often first appears[50]). Professor Dan Kuehl of the National Defense University's School of Information Warfare worries that this "growing intermingling in the integrated information society of systems used and needed by both the military and civil sides of society . . . is making our national information infra-

structure a viable, legal, and ethical target in the case of conflict."[51] Nowhere is this use more extensive than in the communications' area.[52] The U.S. armed forces—like other modern militaries—relies heavily upon the civilian communications infrastructure; more than 90 percent of its messages flow through commercial channels.[53] If that system is attacked by a belligerent intent upon cutting that flow, what does its loss mean to noncombatants in today's society?

Attacks against communications nodes and their related computer facilities do more than just inconvenience people in technologically advanced societies. Such systems support essential emergency services and quite often control critical parts of the infrastructure indispensable to civilians, especially in vulnerable urban areas. Consequently, strikes against electrical grids, designed to undermine a *military's* high-tech computer and communications capabilities, have profound—and often unintended—"reverberating effects" on *noncombatants* and *their* high-tech systems.[54]

Statesmen and soldiers must consider the legal and moral ramifications of using civilian systems for military purposes. Such military use may turn them—as well as their supporting infrastructure—into a bona fide target for future opponents. Parenthetically, statesmen and soldiers must also ask themselves the practical question as to whether they are creating target sets whose destruction could cause undue noncombatant hardships in the United States without a corresponding vulnerability for adversaries from less-developed countries.

Of course, depending upon the adversary, attacks on *their* dual-use systems could be equally devastating to their civilian populace. Thus, it is essential for statesmen and soldiers to avoid the misconception that "surgical" strikes using certain high-tech methodologies (PGMs or even a "bloodless" computer attacks) necessarily obviates legal and moral complications just because the *immediate* casualties

(including noncombatant losses) may be few.[55] Commander James W. Crawford explains:

> Precision technology limits the immediate and direct harmful effects of aerial bombardment. However, one must take issue with the assertion that the systematic destruction of the civil infrastructure through the use of precision weapons actually reduces the harmful effects of war. Ironically, the very capability of precision potentially augers greater collateral casualties, not less . . . [PGMs are] clearly an efficient and effective application of force. . . . Unfortunately, such a methodology not only impedes the enemy in some respects, but it also eliminates civilian life-support systems.[56]

Attacks on dual-use systems need not, however, be foregone. Rather, what is needed is a firm grasp of the long-term, *indirect* impact upon noncombatants *prior* to the authorization of an attack. Clearly, an enhanced intelligence architecture is necessary to provide the right kind of data to conduct the more probing proportionality calculation these new technologies require.[57]

One way of analyzing the data that an enhanced intelligence system might provide would be to employ the new modeling and simulation techniques now becoming available. For example, using data drawn from Joint Resource Assessment Data Base, U.S. Strategic Command's Strategic War Planning System (SWPS) can project the expected numbers of killed and injured when a given nuclear weapon is delivered by a designated platform in a certain fashion on the selected target.[58] Similar systems could be developed to analyze the effects of conventional attacks on high-tech networks.

However, modeling and simulation themselves present significant recomplications for statesmen and soldiers. Specifically, are leaders legally or morally *obliged* to follow the model? Suppose, for example, that a decisionmaker chooses a course of action that the model shows will result in greater noncombatant casualties than another available option. Since the legal and moral duty is to "take all feasible

precautions" to avoid noncombatant casualties,[59] if a computer calculates that a certain method of attack among several options most minimizes noncombatant loses, does that automatically preclude consideration of the other options? If a commander selects another option, has he failed to do everything "feasible" to avoid noncombatant losses? How will a commander justify a decision that seems to fly in the face of dispassionate computer logic? Consider that casualty estimates from whatever source can create very real quandaries for commanders at a later time. In the recent controversy over the decision to use the atomic bomb on Japan to end World War II, the relatively crude casualty estimates of nearly 50 years ago were relied upon by some to assert that an invasion would have cost fewer lives than the atomic attack.[60]

What the atomic bombs dropped on Hiroshima and Nagasaki did do, however, was to evaporate what was left of the Japanese government's will to resist. The object in war is to break the enemy and to impose our will in its stead. That is best accomplished with a combination of psychological and physical shock. The dropping of two atomic bombs in August 1945 seems to have accomplished that objective.

As technology progresses, one might fairly expect the fidelity of the models to improve,[61] but it is not yet clear that they can *ever* substitute for the judgment of the commander in the performance of the warfighting *art*. The linear, mathematical nature of computer processes may never be able to replicate the nonlinear and often unquantifiable logic of war.[62] The history of human conflict is littered with examples of how military forces achieved results that no algorithm would have predicted.[63] Still, in a world that increasingly considers reports provided by an electronic brain innately more authoritative than human-derived analyses, it may well behoove decisionmakers in future conflicts to somehow capture the essence of their rationale when they select a computer-produced option that on its

face seems to be more casualty-intensive than another course of action assessed by the same source.

Paralleling the problematic commingling of military and civilian high-tech facilities is the infusion of civilians into formerly military jobs. In the past few years there has been a determined effort to convert as many military billets as possible to less expensive civilian positions.[64] For much the same reason, other efforts have attempted to privatize and outsource many functions traditionally performed by uniformed personnel. These initiatives have resulted in thousands of civilians filling what were once military assignments at stateside bases and, increasingly, on foreign deployments.[65]

While these actions are principally motivated by a desire to save scarce defense dollars, they are also a tacit recognition that the growing sophistication of the technologies of war require the military to ever more frequently tap civilian expertise. *Armed Forces Journal* reports, for example, that in fiscal year 1997, 70 percent of the Department of Defense's information technology transactions were outsourced to private vendors.[66]

This trend exacerbates the long-held fear that new technology requiring ever-greater civilian involvement will cloud a principle vital to the law of armed conflict:[67] the requirement to distinguish between combatants who could be legitimately attacked, and noncombatants who could not. As with civilian *objects*, current international law requires belligerents to exercise "care to separate individual civilians and the civilian population as such from the vicinity of military objectives."[68]

International law does, however, recognize that civilian technicians and contractors are necessary for modern militaries. It holds that they are subject to attack only when actually performing tasks in support of the armed forces. Unlike uniformed personnel, they would not ordinarily be targeted when they are away from their jobs. If captured, they are entitled to treatment as prisoners of war.[69]

Nonetheless, the law has always held that noncombatants' "immunity from damage and harm was predicated upon their obligation to abstain from hostile acts. If they took action against a party's armed forces, they automatically lost immunity."[70]

Unfortunately, that appears to be exactly the direction we are heading. *Defense News* characterized the large numbers of civilian technicians required for the Army's digitized battlefield as "surrogate warriors."[71] Indeed, the operation of high-technology systems is moving civilian technicians and contractors from traditional support functions to what are arguably "hostile" activities. For example, a civilian technician who helps *execute* a computerized offensive information *attack* against an enemy system may well have gone beyond mere "support."

Likewise, the Air Force, probably unaware of the implications of its statement, has openly announced its intention to use civilians *operationally*. In *Global Engagement: A Vision for the 21st Century Air Force,* the service states that "combat operations in the 21st Century" will broaden "the definition of the future operator."[72] It goes on to state that: "In the future, any military *or civilian* member who is experienced in the employment and doctrine of air and space power will be considered an *operator*."[73]

Once civilian technicians or contractors become involved as "operators" in "combat operations," they risk being characterized as "unlawful combatants" under international law.[74] This has a number of consequences, including the possibility that if captured they can be tried and punished for their hostile acts, to include the same things for which a uniformed combatant would be immune.[74] It is very doubtful that many of these "surrogate warriors" are cognizant of their new status or comprehend the ramifications of it.

Since it is unlikely that military dependence on civilian expertise will diminish any time soon, several writers suggest establishing a new type of part-time military.[75] It

would be composed of engineers, information specialists, and other technical experts who could be called into military service when necessary. Endowing civilians with military status would support recognition as lawful combatants under international law, and would also be a step toward solving another problem with civilianizing military functions: the fact that civilians cannot be compelled to stay on the job in times of crisis.[77] Only those subject to military discipline have a legal or moral responsibility to remain at their posts.

While this approach would solve one technology-driven problem, it creates a new recomplication for statesmen and soldiers. Specifically, these proposals differ from ordinary Guard and Reserve membership in that the military affiliation contemplated would not require the technical experts to undergo all the rigors of military training.[78] In describing such an organization composed of information specialists, Brigadier General Bruce M. Lawlor, ARNG, argues that the well-paid "innovators, intellectuals, and highly-skilled technicians" most needed would "not likely be impressed by the opportunity to wear hair 'high and tight' or do pushups and two-mile runs."[79] Accordingly, he recommends that "much of the military regimen" be discarded.[80]

Soldiers and statesmen need to be cautious, however, about abandoning "much of the military regimen" simply to indulge the predilections of civilian technical experts. Military personnel are not just people in uniforms. There are instead, as Stephen Crane, the author of *Red Badge of Courage*, put it, "a mysterious fraternity born out of smoke and the danger of death."[81] In his book, *Acts of War: The Behavior of Men in Battle*, Richard Holmes explains:

> However much sociologists might argue that we live in an age of "narrowing skill differentials," where many of the soldier's tasks are growing ever closer to those of his civilian contemporaries, it is an inescapable fact that the soldier's primary function, the use—or threatened use—of force, sets him apart from civilians . . . [T]he fact remains that someone

> who joins an army, is both crossing a well-defined border within the fabric of society, and becoming a member of an organization which, in the last analysis, may require him to kill or be killed.[82]

Importantly, Holmes argues that much of the military's regimen (even including such things as haircuts) has psychological importance beyond its obvious practical value. Many military requirements and rituals serve to acculturate an individual to the armed forces and to build the kind of unit cohesion and *esprit de corps* necessary to endure the enormous pressures of combat. Importantly, for statesmen and soldiers concerned about the ethical conduct of war, such a transformation also helps to create a selfless, morally conscious combatant.

The uncertainties and unpredictable dynamics of 21st century battlefields make it unwise to assume that technical experts will always be in situations that render unnecessary the kind of bonding and mental preparation that has sustained winning military organizations for centuries. Notwithstanding the need to secure sufficient numbers of technical experts for 21st century conflicts, statesmen and soldiers must be especially wary of any actions that might erode the altruistic warrior ethos that underpins instinctively proper behavior in the crucible of war.

Civilianizing uniformed positions is not the only way the U.S. defense establishment hopes to deal with tight budgets. Innovative applications of technology are also expected to help control costs. But cost is a two-edged sword in the context of the RMA. While computers and other information technologies often produce economies, the price of many new weapons is still quite high. PGMs, for example, are significantly more expensive than unguided "dumb" bombs.[83] This fact produces a new question for statesmen and soldiers: to what extent must a nation's people sacrifice in order to acquire systems to protect *enemy* civilians? If a relatively inexpensive artillery barrage can neutralize an enemy force notwithstanding a few noncombatant

casualties, is the commander obliged to employ a costly bevy of PGMs to reduce that number to zero? It could be argued that simply having PGMs mandates their use under the theory that the commander has an available alternative that can save noncombatant lives. The accepted view, however, holds that there is no *per se* obligation to use PGMs so long as the tenets of the law of armed conflict are observed.[84] The commander can properly consider the price of the weapons as a factor in deciding the means of attack.[85]

For statesmen and soldiers, however, there is the further question of expectations raised by Gulf War videos of PGMs.[86] Undoubtedly, the perception that PGM use avoids virtually all collateral losses is something that could create a new precept in the court of world opinion. A paradigm might arise that assumes that if the United States wishes to do so, it can employ force via PGMs in any circumstance with few or no noncombatant casualties.[87]

It is the converse that statesmen and soldiers may find most vexing, that is, the perception that the *failure* to use PGMs represents a considered American decision to *cause* noncombatant deaths. If this perception comes to represent the consensus of world opinion, it is not inconceivable that international law may someday *require* PGM use (as well as other high-tech instrumentalities) by those nations with the resources to produce or acquire them.[88] At first blush such a development would appear to be morally and ethically attractive, but consider that even for wealthy nations like the United States, national budgets are zero-sum games. For each dollar spent to acquire an expensive PGM, one less dollar is available for other desirable social purposes. President Dwight Eisenhower captured this dilemma in a 1953 speech when he pointed out that:

> Every gun that is made, every warship launched, every rocket fired, signifies in the final sense a theft from those who hunger and are not fed, those who are cold and are not clothed. The world in arms is not spending money alone. It is spending the sweat of its laborers, the genius of its scientists and the hopes of its children.[89]

This raises an intriguing question: To what extent is the civilian populace of an *aggressive* belligerent entitled to the treasure of a *rightful* defender?[90] How many of the rightful defender's own people should be denied, for example, prenatal care to make resources available to procure PGMs so that if it must defend itself the danger of collateral civilian casualties in the *aggressor* state is minimized? In analyzing this question one may wish to ponder historian Daniel Boorstin's contention that Americans suffer from the "Myth of Popular Innocence," that is, the tendency to demonize enemy leaders but absolve adversary populations of responsibility in war.[91] Americans often assume that enemy societies are helpless victims of powerful tyrants—despite evidence, Boorstin contends, that "[r]ecent history proves that ruthless rulers can be removed by popular will."[92]

Even if one chooses to exculpate the populations of totalitarian states, technology may yet recomplicate moral judgments when addressed to nations with other forms of government, especially democracies. Proponents insist that the phenomenal growth of the Internet and other communication technologies has helped stimulate the rise of democracies around the world. A September 1997 article in the *New York Times Magazine* credits modern communications technologies with spurring the growth of democracy and forcing totalitarian regimes to wither.[93] Another author, analyzing the nature of advanced communications capabilities, maintains that high technology and totalitarian governments are "oxymorons."[94] Thus, if revolutionary communications systems produce democracies as the enthusiasts contend, then we are on the verge of a new era of techno-peace as conventional wisdom holds that "democracies don't fight democracies."[95]

Regrettably, however, new studies are eroding the "democratic peace" thesis.[96] In truth, the notion that democracies may indeed fight democracies should not really be surprising given the growing evidence of war's cultural basis.[97] According to Samuel Huntington, future conflicts

may well arise not from nations in the grip of a depraved leader (as Americans are wont to believe) but rather from clashes between *civilizations* whose basic values are fundamentally at odds.[98] Bosnia presents a manifestation of Huntington's hypothesis. Henry Kissinger argues that it was a misconception that the removal of a few "evil bigots" there would create unity and peace in a society where deep-seated ethnic hatreds pervade the populations.[99] Quite obviously, Americans must learn to accept that whole societies may *freely* choose to embark upon courses of action that lead to war.[100]

Still, international law has never sought to necessarily equate "noncombatant" status with moral innocence. But should the sentient, adult population in a democracy escape responsibility for their nation's actions in an era when science is globalizing weapons of mass destruction? James W. Child contends, for example, in *Nuclear War: The Moral Dimension* that "people have a duty to restrain their government from committing nuclear aggression, and if they fail in that duty, their absolute immunity as noncombatants is undermined."[101] Even the U.S.'s Declaration of Independence asserts the Lockean concept that people have a *duty* "to alter or abolish" their government when it fails to serve "life, liberty, and the pursuit of happiness."[102] Though beyond the scope of this paper, it may be appropriate for statesmen and soldiers to reexamine the question of the culpability of democratic societies engaged in high-tech conflict. That examination could indicate that—at least where democratic states are concerned—a modification of current understanding of "noncombatant" immunity might be in order, especially when such states engage in unlawful acts such as the wrongful use of a weapon of mass destruction.

Information Operations.

The idea that democratic societies might properly be held accountable for the unlawful actions of their

governments raises the broader question as to whether democracies ought to be exempted from certain kinds of information operations that aim to corrupt the democratic process. Powerful information and cyberwar technologies are becoming available that can radically affect an electorate's perceptions of its leaders. Thomas Czerwinski, then a professor at the School of Information Warfare of the National Defense University, indicates how such technologies might be used when he asks: "What would happen if you took Saddam Hussein's image, altered it, and projected it back to Iraq showing him voicing doubts about his own Baath Party?"[103] Quite obviously, the technology implicit in Czerwinski's proposition could just as easily be applied against a democratically-elected leader.

Moreover, the capability is hardly science fiction. As anyone who has seen the film, *Forest Gump,* can attest, technology now permits the creation of extraordinarily convincing but false images.[104] Of course, propaganda aimed at enemy populations has long been considered a legitimate method of warfare. But this norm may need reexamination when the government affected is a democratic one. It needs to be reconciled with a key component of U.S. national security policy: the promotion of democracy.[105] While no one would dispute that the improper *actions* of the leaders of any enemy state—including those of democracies—must be stemmed, it is something altogether different to hold that it is an appropriate strategy to attempt to change democratically-elected leadership via the dissemination of manipulated information.[106]

Furthermore, Michael Walzer asserts that "war aims legitimately reach to the destruction or defeat, demobilization, and (partial) disarming of the aggressor's armed forces. Except in extreme cases, like that of Nazi Germany, *they don't legitimately reach to the transformation of the internal politics of the aggressor state or the replacement of its regime*."[107] Surely, a democratic government is not the kind of extreme case that Walzer exempts. Thus, statesmen and soldiers may wish to develop

policies that restrain information warriors from engaging in tactics that damage the democratic process. Democracy has an intrinsic human value even when it produces governments whose actions lead to war.

The interplay of democratic values and modern technology presents other recomplications for statesmen and soldiers. Specifically, *JV 2010* insists that the U.S. military must have "information superiority" in future conflicts. To do so requires not simply controlling the adversary's information sources, but also the avalanche of data available from third parties, including the global media. This latter source would be extremely difficult to dominate.[108] With the latest technology freeing the press from reliance on—and control by—belligerent governments,[109] it is unlikely that any major aspect of future military operations will escape near-instantaneous reporting by international news agencies. In a very real sense, global news sources could become the "poor man's intelligence service."

In addition, information about current operations will be obtainable from other sources for a modest investment. Already commercial satellites are providing high-resolution images heretofore the exclusive province of the intelligence agencies of the developed nations.[110] Another information source, the Internet, is now being described as a "simple, low-cost, non-threatening and relatively risk-free" way of collecting data valuable to intelligence agencies.[111] All of this makes a strategy of information superiority questionable.

Thus, the capabilities of new technology present statesmen and soldiers with several unattractive options. If "information superiority" is truly imperative, achieving it may require aggressive, draconian measures against international information sources that are not parties to the conflict. Such measures are of doubtful legal and moral validity, and they could have the unintended consequence of antagonizing allies and even bringing the United States

into conflict with third parties.[112] Another approach might be to develop means that discretely deny the transmission of internationally produced information to an adversary. Given the number and variety of sources, however, it would not seem practical or even possible to do so. Finally, we could change our approach, that is, develop doctrine and strategies for conducting military operations in an environment of information *transparency* or information *parity*. It seems that this last alternative, which obviates the need to interfere with information produced by entities not otherwise involved in the particular conflict, would most readily mesh with our legal and moral norms.

Space.

As already implied, any discussion of information operations necessarily brings up the issue of space. Satellites provide critical surveillance and communication support for U.S. forces, as well as those of potential adversaries. According to General Charles A. Horner, space systems are "fundamental to modern warfare."[113] For example, PGMs, the weapons that so many hope will produce more humane warfare, very often require satellite-derived information for guidance.[114] Because of the importance of space to high-tech operations, American military leaders believe that war in space is inevitable.[115] Accordingly, several preparatory steps have been taken, including testing laser weapons against satellites.[116]

However, space warfare presents significant moral recomplications for statesmen and soldiers. Most fundamentally, there is the question as to whether combat operations ought to be conducted there at all. In fact, the nature of space systems creates legal and ethical reasons that weigh against doing so. As previously discussed, a basic LOAC principle is the obligation of belligerents to separate military targets from civilian objects.[117] Since the very beginning of space exploration, however, military and civilian developments commingled to a such a degree that

"the separation of military from civilian . . . space technology [is] meaningless."[118] While there are some purely military systems today,[119] the United States itself relies heavily on civilian satellites, many of which are owned by international consortiums.[120]

Future opponents will likewise depend upon commercial communication and surveillance systems.[121] As a result, space presents the classic legal and moral conundrum of multi-user systems: how do you attack them without causing disproportionate injury to noncombatants and their property, especially when the same system is used by nations not involved in the conflict? As a practical matter, it is difficult to foresee many scenarios where a proportionality analysis[122] would justify attacks on *multi*-user systems. This is especially true as noncombatants in a growing number of countries become ever more reliant on space-based technologies for a whole range of essential communications and other services.

Nonetheless, U.S. Space Command is seeking to have "space" declared its area of operations so as to facilitate planning for conflict there.[123] Little international appetite exists for the notion of militarizing space, however. Virtually every treaty related to space asserts that it is to be used only for "peaceful purposes."[124] (The United States interprets these provisions to prohibit only aggressive military actions.[125]) Is it wise, therefore, for the United States to take actions—such as declaring space as an area of operations for one of its combatant commands—that suggest that space is simply another field of battle?[126] Should statesmen and soldiers advocate a course of action that might stimulate a space arms race, akin to the nuclear arms race, as many fear?[127]

It may be shrewder to pursue a legal regime that declares space a "sanctuary" similar to that afforded communications facilities located in neutral territory.[128] This would permit any nation to use space for communications, surveillance, and comparable activities—

even during armed conflicts—with the systems not being subject to attack. Arguably, this strategy would renew the U.S.'s original policy toward space. President Eisenhower established a "self-imposed space sanctuary policy . . . [in order to] establish the principle of freedom of space, to protect U.S. satellites from interference, *and to avoid an arms race in space*. . . ."[129] "Neutralizing" space would not appear to degrade America's warfighting capability if U.S. space systems were therefore protected and, in any event, existing legal and policy norms already limit or preclude attack on the multi-user international systems that adversaries will rely upon during war.

This proposal would not preclude sub-space means that selectively deny adversaries' military forces the use of signals from space platforms. However, the development of lasers and other space weapons would be prohibited, although passive defensive measures (hardening, stealth, etc.) would be allowed. Accordingly, the proposal would not be inconsistent with current U.S. space policy, which advocates diplomatic and legal "measures to preclude an adversary's hostile use of space systems and services."[130] Some may argue that the movement of weaponry into space is inevitable and cannot be effectively banned.[131] But the remarkable history of nuclear arms control (during which many of the same arguments were made) leaves room for optimism—especially if action is taken soon.

Threshold of Conflict.

Another recomplicating effect of the new technologies is the danger that they may inadvertently lead to a lowering of the threshold of violent conflict. Peacetime information operations are one example of how this might occur. Consider, for instance, that there is no clearly accepted definition of what kind of data manipulation constitutes "aggression" contrary to international law and condemned by the U.N. Charter.[132] Current interpretations of "aggression" were largely built upon notions of "armed

attack" committed by aggressors employing traditional kinetic-effect weapons.[133] While legal definitions of "armed attack" may seem to allow peacetime data manipulations so long as bombs or bullets are not used,[134] the recipient country may not share such a pacific interpretation and react violently, starting a cycle of escalation unintended by the initiating info-warriors.

The growing proliferation of the popular new "non-lethal" technologies presents similar recomplications.[135] Part of the recomplication results from misunderstanding the terminology. The characterization of these capabilities as "non-lethal," for example, is a source of real confusion—virtually all of them are potentially deadly to some persons.[136] Moreover, certain of them also clash with existing treaties such as those that limit or prohibit the use of chemical and biological agents.[137] Consequently, while items like rubber bullets, sticky foam, and so forth do have the potential to lower the risk of casualties in particular situations, there is the danger that decision-makers will be seduced by the same misconception discussed previously in this essay, that is, the flawed notion that military operations can be conducted without risk to soldiers or civilians.[138]

All of this is especially worrisome because of the unpredictability of the reaction of those against whom supposedly nonlethal means are used. To reiterate a central theme of this essay: what was intended as a "bloodless" means of coercion may well generate a lethal response. It would seem prudent then for statesmen and soldiers to view information operations and "non-lethal" technologies principally as means to minimize noncombatant casualties under circumstances *where the use of force is otherwise necessary and appropriate*. If this is clearly understood, miscalculation is averted, and the unintended involvement in unexpectedly hostile situations is precluded.[139]

It is worth noting that a similar issue exists with regard to other high-tech systems. Indeed, the post-Gulf War uses

of PGMs against Iraq raise the issue. Quite often the declared purpose is to "send a message" to that government, a function traditionally the role of a diplomatic bag. Analysts A. J. Bacevich and Lawrence F. Kaplan ask, "Given the precision weapons that the United States advertises as central to the new American military doctrine, how many people is it permissible to kill merely to send a message?"[140]

It is true that affecting the psychology of an adversary could constitute a legitimate military objective.[141] The difficulty, as Geoffrey Best notes, is quantifying the often very subjective estimates of psychological effects into something rational enough to support a meaningful finding of the "definite military advantage" that the law requires to warrant the use of force.[142] How does one definitively assess, for example, the psychological effect of an incremental use of force on persons of another culture?[143] Absent the supporting data, the use of force for psychological purposes may be difficult to justify. The real issue for statesmen and soldiers is ensuring that the casualty-minimizing features of high-tech weaponry do not induce decisionmakers to inappropriately lower the threshold for the use force. Bacevich and Kaplan warn:

> Ultimately, a doctrine that relies on antiseptic methods of warfare may prove dangerously seductive. Seemingly tailor-made for an era of post-modern politics, precision weapons also have the potential to increase the propensity of political leaders to resort to violent means. The ready availability of [PGMs] may tempt them to conclude that force need no longer remain the option of last resort, and induce them to employ their arsenal without due reflection.[144]

Organizational Culture.

High technology also carries potential unexpected consequences for the organizational cultures of militaries on 21st century battlefields. Communications advances will be the most important agent of organizational change. As

JV 2010[145] indicates, technology is already becoming available that will provide individual soldiers with unprecedented access to all kinds of information.[146] Such technology will allow the elimination of various levels of command and supervision resulting in a "flattening" of traditionally hierarchical military organizations. Other technology fathered changes will directly affect battlefield organization. The Marine Corps, for example, is experimenting with a new concept called "infestation tactics" which capitalizes on the new technologies.[147] The technique relies on advanced communications systems to coordinate large numbers of small infantry teams assaulting the same objective.

While increased combat effectiveness should result from these and other technology-driven organizational changes, there are, nevertheless, potential "revenge effects" of concern to statesmen and soldiers. In his book, *The Unintended Consequences of Information Age Technologies*, David S. Alberts warns that when subordinates are provided with the "larger picture" that new data transfer capabilities allow, they are "likely to second-guess decisions made at higher levels and . . . have the information required to undertake initiatives their superiors may find inappropriate."[148]

It seems therefore that, ironically, *controlling* the actions of lower echelon troops may not necessarily be enhanced by better communications technologies. Regrettably, it is at those very levels that the risk of indiscipline is the greatest—the My Lai massacre during the Vietnam War being just one example.[149] Sadly, atrocities seem to be an enduring feature of war. Stephen Ambrose notes that:

> When you put young people, eighteen, nineteen, or twenty years old, in a foreign country with weapons in their hands, sometimes terrible things happen that you wish never happened. This is a reality that stretches across time and across continents. It is a universal aspect of war, from the time of the ancient Greeks up to the present.[150]

What is worrisome about 21st century battlefield technology is that it will put ready access to vastly more potent firepower into the hands of the young troops that Ambrose describes. The new battlefield organization produced by infestation tactics is illustrative. Analysts assert that the "most revolutionary aspect" of the new concept is that the infantryman does not rely on his personal weapon to engage the enemy, but will instead call in external fire support.[151] In short, the experts say, "[r]ather than a "shooter," the infantryman becomes a "spotter.'"[152] They further observe that:

> This change of identity for the infantryman stems from technological advances. With enhanced digital communications, more accurate smart munitions, and manportable guidance systems, fire support . . . is the king of the battlefield. In addition to traditional tube artillery, the individual team can call for and direct close air support, rocket fires, naval gunfire, and missile attacks.[153]

Quite obviously, whatever havoc troops were able to wreak with their personal weapons at places like My Lai, that terrible potential will be markedly greater in future conflicts because of the new technologies of war, particularly since the command and supervisory structure that might intervene is, by design, less robust.

By empowering junior personnel, the new technologies of war create other recomplications as well. *Aviation Week & Space Technology* reports that senior American officials are concerned about the effect of the absence of clear rules concerning information operations.[154] They believe that "Once soldiers and airmen start dying in a war, the young computer-literate officers and enlisted men are going to start making their own efforts to crack enemy computer systems."[155] Free-lance efforts of this sort can create serious problems. For example, a computer virus loosed on an enemy might have "unintended consequences and come back and cripple friendly computers."[156] The adverse

"reverberating effects" of such actions on noncombatants may be quite significant.

Still, the solution is not to deny lower echelons the benefits of the technology. Rather, when technology dramatically empowers junior personnel, steps must be taken to ensure that they are fully prepared, both technically and psychologically, to handle the greater legal and moral responsibilities that the enhanced capabilities impose upon them. Unquestionably, maintaining discipline and professionalism under the new combat conditions is more essential than ever—yet ever more difficult to guarantee.

Another recomplicating effect is caused by the proliferating numbers of e-mail-equipped laptop computers, fax machines, and similar technologies that troops themselves own and carry with them into war zones.[157] What is more is that, according to Congressman Newt Gingrich, "virtually every soldier in combat in 2010 will have somewhere on their body a personal telephone linked by satellite to a world telephone network."[158] Such devices raise a number of complications, not the least of which is that they are extremely vulnerable to monitoring by hostile forces.[159]

Equally important is that these devices hasten the day when the authority of the military commander could be questioned on the battlefield—a development with potentially disastrous consequences. Instant communications by soldiers from future battlefields causes Nicholas Wade to question, "Would any commander want his soldiers to receive parental advice in the midst of a firefight? What if Dad disagrees with the officer in the scene? As Napoleon said, 'one bad general is better than two good ones.' "[160] Similarly, *Newsweek* asked over 6 years ago, "if soldiers can phone mom or the local newspaper from the middle of the battlefield, what are the implications for maintaining military discipline or secrecy?"[161]

To answer such concerns some commanders will attempt to restrict the use of these communications devices. But is this realistic? Can a democracy reliant on an all-volunteer force expect to isolate forward-deployed troops from contact with their friends and families, especially when they may have grown up in an environment of instant communications gratification? It may be more practical, as suggested previously, to abandon the goal of information security and plan accordingly.[162]

Finally, the inculcation of the revolutionary technologies into the armed services might create a generation of "console warriors" who wage war without ever confronting the deadly consequences of their actions. Statesmen and soldiers should not assume that such combatants will automatically share the military's traditional values that restrain illegal and immoral conduct in war. Up until now, much of the military's ethos was drawn from concepts of honor and chivalry sourced in the physical reality of direct combat. Although the extent to which the proliferation of long-distance push-button war serves to replace that ethos with a new ethic is as yet uncertain, it is imperative that whatever emerges instills in tomorrow's soldiers those moral underpinnings which will further develop the application of ethical and legal norms in future conflicts.

Summary and Conclusions.

At this point, the reader may agree that the promise of the introduction of this essay has been fulfilled: far more questions have been raised than solutions offered. Hopefully, it is now clear that despite their many beneficial aspects, the emerging RMA technologies have great capacity for unintended consequences and revenge effects. Our examination reveals several broad themes that statesmen and soldiers may wish to address:

- *The unpredictability of an adversary's response to high-tech attack*. While U.S. intent in using PGMs or other high-tech means in a particular conflict might

be to minimize casualties on both sides, their use may, nevertheless, drive an enemy incapable of responding in kind to resort to measures that could make war, paradoxically, *more* destructive or inhumane than if the high-tech weapons had not been used at all.

- *The increasing commingling of military and civilian high-tech systems*. Although this dual- and multi-use trend is unlikely to change in the future, greater consideration should be given to the moral and legal implications of making legitimate targets out of systems upon which technology-dependent societies rely. Where possible, steps should be taken to ensure that essential services are preserved in the event of war. At a minimum, decision-support systems need to be developed not only to analyze the vulnerability of friendly populations but also to assess high-tech targets in hostile countries in order to assist military commanders in making an informed proportionality judgment. Such systems need to be able to evaluate secondary, reverberating effects on civilian populations.

- *The blurring of the distinction between noncombatant civilians and combatant military personnel*. Technologies, along with budget-driven decisions to outsource and privatize and otherwise civilianize military functions, carry moral and legal implications. Care must be taken to ensure that a whole class of unlawful combatants is not inadvertently created. There may be utility in devising new kinds of reserve organizations for technologically skilled personnel which do not require members to conform to all the rigors of a professional military. However, such efforts must not compromise those aspects of the military regimen that develop military's altruistic, warrior ethos which underpins moral conduct in war.

- *Information operations*. Information operations (IO) and cyberwar can complicate the moral life for statesmen and soldiers in many ways, but of particular concern are the new techniques that can interfere with democratic societies. IO and cyberwar techniques are properly applied to control the aggressive behavior of nations, but they should not be permitted to destroy democratic values in the process. Moreover, the proliferation of third-party communications sources renders suspect military strategies aimed at achieving information superiority.

- *The militarization of space*. Satellites and space vehicles are irrevocably integrated into modern warfare. However, this does not mean that space should become another battlefield. Rather, the United States should use its prestige as the preeminent space power to forge an international consensus that designates space a neutral area and, therefore, possibly avoid a space weapons race.

- *The lowering of the threshold of conflict*. Advanced technology provides the capability to employ coercion via non- or low-lethal means in a way that greatly minimizes the immediate noncombatant losses. Because of the unpredictability of the response of those targeted, however, care must be taken to ensure that misapprehensions of the nature and implications of military means do not delude decisionmakers with visions of "bloodlessly" compelling opponents short of violent conflict. Absent such caution we risk taking actions with the dangerous potential to spin out of control into full-scale war.

- *Organizational Culture*. Vastly enhanced communications capabilities that shift more and more battlefield responsibilities to lower-levels of command must be accompanied by appropriate training to ensure

that legal and moral norms of the law of war are observed by technology-empowered junior personnel.

These are by no means all the high technology issues with potential to recomplicate moral life for 21st century statesmen and soldiers. Of course, it would be a mistake to conclude that the problems just discussed somehow warrant a retreat from infusing RMA technology into defense planning. After all, high-tech weapons ordinarily *do* have their *intended* effect—and sometimes *that* is the unexpected consequence. For example, military historian Martin Van Creveld observes that, ironically, "in *every* region where [nuclear weapons] have been introduced, large-scale, interstate war has as good as disappeared."[163] In short, however horrific their potential, nuclear weapons have successfully performed the deterrent function that creators hoped they would, to the surprise of a myriad of naysayers. To many it is, perhaps, the ultimate unexpected—though not unintended—consequence that the advent of the nuclear age has coincided with the absence of the kind of savage global war that twice visited the world this century.

While technology can obviously deter war, it is still true that "technology and warfare have never been far apart."[164] Clearly, statesmen and soldiers need to be concerned about procuring the technology necessary for U.S. forces to prevail in any conflict. Analysts Ronald Haycock and Keith Neilson ominously warn that "technology has permitted the division of mankind into ruler and ruled."[165] In that regard, even America's vaunted free-enterprise system, the engine that fuels its technological might, has its own recomplications.

Consider that American values—in this instance the commitment to full and fair competition within a capitalistic economy—might deny U.S. troops the best technology on 21st century battlefields. Author David Shukman explains: "While the Western military struggle for a decade on average to acquire new weapons, a country with commercially available computer equipment and *less*

rigorous democratic and accounting processes could field new systems within a few years. It is the stuff of military nightmares."[166] Although high-tech systems are touted as a means to get inside an adversary's "decision loop,"[167] the reality is that nations unencumbered by Western-style procurement regulations may well be able to get inside our "acquisition loop" and field newer weaponry even before the United States finishes buying already obsolete equipment.

Just as the speed of technological change creates difficulties for the procurement process, so it does for those concerned with law, ethics, and policy. President Harry Truman once remarked that he feared that "machines were ahead of morals by some centuries." That certainly is the case in today's RMA environment.[168] Consequently, statesmen and soldiers must accelerate their efforts to develop norms of law, ethics, and policy that honor this nation's finest ideals while at the same time appreciating that "technology is America's manifest destiny."[169]

This is not an easy task. Nor is the problem without historical precedent. Russell F. Weigley notes in his 1977 classic, *The American Way of War,* that: "To seek refuge in technology from hard questions of strategy and policy [is] another dangerous American tendency, fostered by the pragmatic qualities of the American character and by the complexities of nuclear-age technology." Quite obviously statesmen and soldiers must recognize technology's potential, but they must do so with the clear understanding that it will never substitute for answering the kind of "hard questions" of law, ethics, and policy that will continue to recomplicate moral life on 21st century battlefields.

ENDNOTES

1. Viet Minh artillerymen fired more than 130,000 rounds from over 200 heavy cannons and mortars during the siege. See J. D. Morelock, *The Army Times Book of Great Land Battles,* 1994, p. 262.

2. Bernard and Fawn Brodie, *From Crossbow to H-Bomb,* Midland Edition, 1973, p. 70.

3. See Nathan Perry, "Revolution in Military Affairs," *National Guard Review*, Summer 1997, pp. 23, 51. ("In fact, contrary to the opinions of many analysts, there appears to be a pattern of conflict that follows each major step forward in military technology.")

4. This is not to say that wars of previous eras were not destructive. Consider that the Thirty Years War may have caused a population decline in Europe of as much as a third. See Curt Johnson, "Thirty Years' War," in *Brassey's Encyclopedia of Military History and Biography,* Franklin D. Margiotta, ed., 1994.

5. Lieutenant Commander Jeffrey A. Harley, "Information, Technology, and Center of Gravity," *Naval War College Review*, Winter 1997, pp. 65, 80. ("[T]he exposure of the American public and media only to high-technology combat supported an aversion to casualties and an expectation of sophistication that will not be appropriate in all future conflicts. The danger in making this particular work a blueprint for future conflicts is that it reinforces a growing perception that war can be nearly bloodless.")

6. George and Meredith Friedman, *The Future of War*, 1996.

7. *Ibid.*, p. xi.

8. There are many possible definitions of information operations but a common official definition is that used by the Air Force, that is, "actions taken to gain, exploit, defend, or attack information and information systems." Air Force Doctrine Document 1, *Air Force Basic Doctrine,* September 1997, p. 44, hereinafter AFDD-1. This definition is almost identical to that once used by the Air Force to describe information *warfare.* See Captain Robert G. Hanseman, USAF, "The Realities and Legalities of Information Warfare," No. 42, *A.F. L. Rev.,* 1997, pp. 173, 176, citing USAF Fact Sheet 95-20, November 1995.

9. Cyberwar suggests a form of warfare more holistic, strategic, and manipulative of information in its concept than the "information operations" definition set forth in note 8 *supra*. AFDD-1 notes the following:

> In describing information operations, it is important to differentiate between "information in war" and "information warfare." The second element, information warfare, involves such diverse activities as psychological warfare, military deception, electronic combat, and both physical and cyber attack.

AFDD-1, *Ibid.* For an excellent cyberwar scenario, See John Arquilla, "The Great Cyberwar of 2002," *Wired*, February 1998, p. 122.

10. He visualized the foe's phone system brought down by a computer virus, logic bombs ravaging the transportation network, false orders confusing the adversary's military, the opponent's television broadcasts jammed with propaganda messages, and the enemy leader's bank account electronically zeroed out. All of this is expected to cause the adversary to give up. See Douglas Waller, "Onward Cyber Soldiers," *Time*, August 21, 1995, p. 38.

11. The Department of Defense defines these weapons as follows:

> Weapons that are explicitly designed and primarily employed so as to incapacitate personnel or material, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment. Unlike conventional lethal weapons that destroy their targets principally through blast, penetration and fragmentation, non-lethal weapons employ means other than gross physical destruction to prevent the target from functioning. Non-lethal weapons are intended to have one, or both, of the following characteristics: a., they have relatively reversible effects on personnel or material; b., they affect objects differently within their area of influence.

Nonlethal Weapons: Terms and References, USAF Institute for National Security Studies, Colorado Springs, CO, Robert J. Bunker, ed., July 1997, p. ix, citing Department of Defense Directive 3000.3, *Policy for Non-Lethal Weapons*, July 9, 1996.

12. For a discussions of "the revolution in military affairs" in the information age, see, generally, "Select Enemy. Delete.," *The Economist*, March 8, 1997, p. 21; Eliot A. Cohen, "A Revolution in Warfare," *Foreign Affairs*, March/April 1996, p. 37; Andrew F. Krepinevich, "Cavalry to Computers: The Pattern of Military Revolutions," *The National Interest*, Fall 1994, p. 30; and James R. Fitzsimonds and Jan M. Van Tol, "Revolutions in Military Affairs," *Joint Force Quarterly*, Spring, 1994, pp. 24.

13. "The Future of Warfare," *The Economist*, March 8, 1997, p. 15.

14. See Robert N. Ellithorpe, "Warfare in Transition? American Military Culture Prepares for the Information Age," a presentation for the Biennial International Conference of the Inter-University Seminar on Armed Forces and Society, Baltimore, MD, October 24-26, 1997, p. 18, "American military culture historically emphasized scientific

approaches to warfare to the point of holding an almost mystical belief in the power of technology to solve the challenges of war," unpublished paper on file with author.

15. See, generally, Colin S. Gray, "U.S. Strategic Culture: Implications for Defense Technology" in *Defense Technology,* No. 31, Asa A. Clark IV and John F. Lilley, eds., 1989. Gray quotes George S. Patton, Jr:

> The Americans, as a race, are the foremost mechanics of the world. America, as a nation, has the greatest ability for the mass production of machines. It therefore behooves us to devise methods of war which exploit our inherent superiority. We must fight the war by machines on the ground, and in the air, to the maximum of our ability . . . .

Ibid., citing George S. Patton, Jr., *War as I Knew It*, No. 345, 1947; Bantam reprint, 1980.

16. Chairman of the Joint Chiefs of Staff, *Joint Vision 2010*, 1996 [hereinafter referred to as *JV 2010*].

17. General John M. Shalikashvili, *Ibid.,* p. ii.

18. *Ibid.,* p. 1.

19. Edward Tenner, *Why Things Bite Back: Technology and the Revenge of Unintended Consequences*, 1996.

20. LOAC might be described as follows:

> LOAC is a body of law that derives from several international treaties, specifically, the Hague and Geneva Conventions, as well as customary international law, law created by the custom and practice of civilized warring states, which is binding on all nations. It applies to all armed conflicts between states, thus, civil wars or battles with terrorist groups are not covered. Hague Law is concerned mainly with the means and methods of warfare, while Geneva Law is concerned with protecting persons involved in conflicts, such as POWs, the wounded, and civilians.

Hanseman, *supra* note 8, p. 189.

21. Geoffrey Best, *Law and War Since 1945*, 1994, p. 289.

22. W. Michael Reisman and Chris T. Antoniou, *The Laws of War*, 1994, p. xxiv, emphasis added.

23. See note 5, *supra.* This trend has led Edward Luttwak to argue that an even greater investment in technology is required because modern democracies simply cannot tolerate casualties. See Edward Luttwak, "Post-Heroic Armies," *Foreign Affairs*, July/August 1996, p. 33.

24. Walter J. Boyne, *Beyond the Wild Blue: A History of the Air Force 1947-1997*, 1997, p. 7.

25. *Ibid.*

26. There are at least six categories of PGMs: 1) "man-in-the-loop" weapons such as laser-guided bombs which require an operator to "illuminate" the target or weapons that have on-board sensors which allow an operator to guide the weapon to the target; 2) autonomous weapons relying only on inertial navigation systems (INS) and autonomous weapons updated by Global Positioning Satellites (GPS) for guidance to the target; 3) autonomous weapons with terrain-aided INS/GPS systems; 4) autonomous weapons with INS/GPS systems and template matching algorithms for guidance; 5) anti-emitter PGMs that rely on onboard systems to home on emitting targets such as enemy radars; and 6) PGMs with "smart" submunitions that use various sensors to guide themselves to targets. See John Birkler *et al.*, *A Framework for Precision Conventional Strike in Post-Cold War Military Strategy*, Rand Corporation, 1996, pp. 6-11.

27. *JV 2010, supra* note 16, p. 21.

28. Benjamin S, Lambeth argues:

> [P]ossibly the single greatest impact of the technology revolution on airpower and its effectiveness relative to other force components is its capacity to save lives through the use of precision attack to minimize noncombatant and friendly fatalities by the substitution of technology for manpower and the creation of battlefield conditions in which land elements, once unleashed, can more readily do their jobs because of the degraded capabilities of enemy forces.

Benjamin S, Lambeth, "Technology and Air War," *Air Force Magazine*, November 1996, pp. 50, 53. See also Lieutenant Colonel Edward Mann, "One Target, One Bomb," *Military Review*, September 1993, p. 33; *contra* see Sean D. Naylor, "General: Technology is No Substitute for

Troops," *Air Force Times*, March 3, 1997, p. 26, citing remarks by General John Sheehan, USMC, then Commander-in Chief of U.S. Atlantic Command.

29. Military necessity may be defined as follows:

> Military necessity is the principle which justifies measures of regulated force not forbidden by international law which are indispensable for securing the prompt submission of the enemy, with the least possible expenditure of economic and human resources. . . . The principle of military necessity is not the 19th Century German doctrine, *Kriegsraison*, asserting that military necessity could justify any measures—even violations of the laws of war—when the necessities of the situation purportedly justified it.

Department of the Air Force Pamphlet 110-31, *International Law—The Conduct of Armed Conflict and Air Operations*, November 19, 1976, para. 1-3a(1) [Hereinafter referred to as AFP 110-31].

30. David R. Markow, "The Russians and Their Nukes," *Air Force Magazine*, February 1997, p. 41.

31. Colonel James P. Terry, USMC, "Operation Desert Storm: Stark Contrasts in Compliance with the Rule of Law," No. 41 *Naval L. Rev.,* No. 83, 1993, pp. 92-94. More than 600 wells were fired.

32. Michael N. Schmitt, "Green War: An Assessment of the Environmental Law of International Armed Conflict," No. 22, *Yale J. of Int'l L.,* No. 1, 1997, p. 21. Schmitt concludes that, in any event, "the damage inflicted so outweighed possible gains the acts were wrongful under international law." *Ibid.*

33. See, also, Adam Roberts, "Environmental Issues in International Armed Conflict: The Experience of the 1991 Gulf War," in *International Law Studies 1996: Protection of the Environment During Armed Conflict*, 1996, pp. 222, 248. ["As to the burning of the oil wells, there is no evidence that Iraq actually intended to achieve a military effect by this means. However, the huge smoke clouds caused by the fires, and poor weather during the last week of the war, did significantly impede air operations over Kuwait, including reconnaissance and ground attack"].

34. See Michael Gordon and Bernard E, Trainor, *The Generals' War*, 1995, p. 364.

35. *Ibid.*, pp. 363-371.

36. However, the Hague Convention IV, 1907 provides that "the right of belligerents to adopt means of injuring the enemy is not unlimited."

37. See Gordon and Trainor, *supra* note 34, pp. 324-326.

38. AFP 110-31, *supra* note 29, provides as follows:

> The term noncombatant includes a wide variety of disparate persons . . . civilians, who are not otherwise lawful or unlawful combatants, combatants who are *hors de combat*, PWs and wounded and sick, members of the armed forces enjoying special status, chaplains and medics, and civilians accompanying the armed forces.

Ibid., para. 3-4.

39. *JV 2010*, *supra* note 16, pp. 28, 34.

40. See Lieutenant Colonel Thomas X. Hammes, "Don't Look Back, They're Not Behind You," *The Marine Corps Gazette*, May 1996, pp. 72-73, discussing the military implications of chaining hostages to targets. Hostage taking was not clearly prohibited until after World War II. See H. Wayne Elliot, Lieutenant Colonel, USA, Ret., "Hostages or Prisoners of War: War Crimes at Dinner," No. 149, *Mil. L. Rev.,* No. 241, Summer 1995.

41. See Stephen Erlanger, "Russia Allows Rebels to Leave with Hostages," *New York Times*, June 20, 1995, p. 1.

42. See "Libyans to Form Shield at Suspected Arms Plant," *Baltimore Sun*, May 17, 1996, p. 14.

43. See Barbara Slavin, "Iraq Leaves U.S. Few Options," *USA Today*, November 14, 1997, p. 13A.

44. James F. Dunnigan, *Digital Soldiers: The Evolution of High-Tech Weaponry and Tomorrow's Brave New Battlefield,* 1996, p. 219.

45. See "Ties that Bind," *The Economist*, June 10, 1995, p. 19, discussing the need for irregular armies to disperse in the face of information-superior opponents and noting that dispersed forces "pose problems" for "high-flying observations systems."

46. See note 83, *supra*, and accompanying text.

47. See Earl H. Tilford, Jr., *Halt Phase Strategy: Old Wine in New Skins . . . With Powerpoint*, Carlisle Barracks, PA: Strategic Studies Institute, July 23, 1998, p. 26.

48. W. Hays Parks, "Air War and the Law of War," No. 32, *A.F. L. Rev.,* No. 1, 1990, p. 168.

49. See Danielle L. Infield, "Precision-Guided Munitions Demonstrated Their Pinpoint Accuracy in Desert Storm; But is a Country Obligated to Use Precision Technology to Minimize Collateral Civilian Injury and Damage?," No. 26, *Geo. Wash. J. Int'l L. & Econ.,* pp. 109, 110-111, note, 1992.

50. "It appears that in a number of technological fields, e.g., micro-electronics and software engineering, the civilian sector has already become more advanced than the military one . . . ." See Lev S. Voronkov, John Grin, and Wim A. Smit, "Some Conclusions on Future Studies and Policies," in *Military Technological Innovation and Stability in a Changing World,* No. 287, Voronkov, Grin, and Smit, eds., 1992.

51. Daniel Kuehl, "The Ethics of Information Warfare and Statecraft," paper presented at InfoWARcon 96, Washington, DC, September 1996, on file with author.

52. However, the dual-use of facilities does occur in other areas. See Matthew L. Wald, "U.S. to Put Civilian Reactor to Military Use," *New York Times*, August 11, 1997, pp. 20.

53. John T. Correll, "Warfare in the Information Age," *Air Force Magazine*, December 1996, p. 3.

54. See Commander James W. Crawford, "The Law of Noncombatant Immunity and the Targeting of National Electrical Power Systems," No. 21, *Fletcher Forum of World Affairs*, No. 101, Summer/Fall 1997.

55. See Winn Schwartau, "The Ethics of Civil Defense and Information Warfare," *Journal of the National Computer Security Association*, NCSA News, June 1997, pp. 15-17.

56. See Crawford, *supra* note 54, p. 114.

57. Essentially, the concept of proportionality requires commanders to refrain from attacks when it "may be expected to cause incidental loss

of civilian life, injury to civilians, damage to civilian objects or combination thereof, which would be excessive in relation to the direct and concrete military advantage anticipated." See AFP 110-31, *supra,* note 29, at para. 5-3c(1)(b)(I)(c).

58. The system uses terms that have specific definitions, and this affects the evaluation. For example, "casualties" are defined as the "estimated number of people who die or receive injuries that require medical treatment and die due to short term effects, 6 months of nuclear detonations." "Population At Risk" is defined as the "total civilian population in danger of dying, independent of shelter, from short term, 6 months effects of nuclear detonations." See Memorandum, *Acronyms/Definitions Used in SIOP Analysis,* U, USSTRATCOM Plans and Policy Directorate, Force Assessment Branch, April 1997, on file with author.

59. See AFP 110-31, *supra* note 29, at para. 5-3c(1)(b)(I)(c).

60. See D.M. Giangreco, "Casualty Projections for the U.S. Invasions of Japan, 1945-1946: Planning and Policy Implications," *The Journal of Military History,* July 1997, p. 521; and Ralph Capio, "FDR and Truman: Continuity and Context in the A-Bomb Decision," *Airpower Journal*, Fall 1995, p. 56.

61. See, generally, Paul R. Camacho, "Further Development in the Construction of Political Action Expert Systems Software: Fuzzy Logic Techniques on Social Science Variables," a presentation for the Biennial International Conference of the Inter-University Seminar on Armed Forces and Society, Baltimore, MD, October 24-26, 1997, unpublished paper on file with author.

62. "War is typically nonlinear, meaning the smallest effects can have unpredicted, disproportionate consequences." See Jeffrey McKitrick, James Blackwell, Fred Littlepage, George Kraus, Richard Blanchfield and Dale Hill, "Revolution in Military Affairs," in *Battlefield of the Future*, Air University, 1995. See also Glenn E. James, "Chaos Theory: The Essentials for Military Applications 57-95," *Newport Paper No. 10*, Naval War College, 1996, discussing the limitations of computer modeling.

63. Ellithorpe, *supra,* note 14, p. 4, "History has demonstrated the fatal error of military decisions based on the use of scientific and technical analysis at the expense of understanding the warfighting art."

64. The GAO found that 45 percent of military personnel performed support functions that could be done by civilians for an average of

$15,000 less. See Tom Bowman, "Drift Military Support Jobs to Civilians, Close Inefficient Facilities, GAO Urges," *Baltimore Sun*, April 5, 1997, pp. 4.

65. Katherine M. Peters, "Civilians At War," *Government Executive*, July 1996, p. 23.

66. David Silverberg, "Crossing Computing's Cultural Chasm, *Armed Forces Journal International*, February 1997, pp. 38-39.

67. AFP 110-31, *supra* note 29, at para. 3-5.

68. Parks, *supra* note 48.

69. *Ibid.*, at para. 3-3.

70. Paul Kennedy and George J. Andreopoulos, "The Laws of War: Some Concluding Reflections," in *The Laws of War: Constraints on Warfare in the Western World*, No. 215, Michael Howard, George J. Andreopoulos, and Mark L. Shulman, eds., 1994.

71. See Bryan Bender, "Defense Contractors Quickly Becoming Surrogate Warriors," *Defense Daily*, March 28, 1997, p. 490.

72. United States Air Force, "Global Engagement: A Vision for the 21st Century," *Air Force*, 1997, p. 7.

73. *Ibid.*, p. 19.

74. AFP 110-31, *supra* note 29, para. 3-3 provides:

> An unlawful combatant is an individual who is not authorized to take a direct part in hostilities but does. The term is frequently used also to refer to otherwise privileged combatants who do not comply with requirements of mode of dress, or noncombatants in the armed forces who improperly use their protected status as a shield to engage in hostilities. . . . Unlawful combatants are a proper object of attack while engaging as combatants. . . . If captured, they may be tried and punished.

Ibid., See also Lieutenant Colonel Robert W. Gehring, "Loss of Civilian Protections Under the Fourth Geneva Convention and Protocol I," No. 90, *Mil. L. Rev.*, No. 49, 1980.

75. “Unlawful combatants” are not ordinarily considered “war criminals.” Rather, they would be subject to prosecution under the domestic law of capturing belligerent, much as out-of-uniform saboteurs would be. During World War II, for example, the United States captured eight German saboteurs and executed six. See *American Heritage New History of World War II,* No. 276, revised and updated by Stephen E. Ambrose based on the original text by C. L. Sulzberger, 1997.

76. See Stephen Bryen, “New Era of Warfare Demands Technology Reserve Force,” *Defense News*, March 17-23, 1997, p. 27; and Brig Gen Bruce M. Lawlor, ARNG, “Information Corps,” *Armed Forces Journal International*, January 1998, pp. 26, 28.

77. Lou Marano, “Perils of Privatization,” *Washington Post*, May 27, 1997, p. 15.

78. *Ibid.*

79. Lawlor, *supra* note 76.

80. *Ibid.*

81. *As quoted in* Richard Holmes, *Acts of War: The Behavior of Men in Combat*, 1985, p. 31.

82. *Ibid.*

83. A PGM is, on the average, fifteen times more expensive than an unguided bomb. See Dunnigan, *supra* note 44, p. 135.

84. See Infield, *supra* note 49, pp. 140-141.

85. *Ibid.*, p. 131.

86. See note 5, *supra*.

87. Iraq enjoyed some success in characterizing itself as a victim using similar logic. See William M. Arkin, “Baghdad: The Urban Sanctuary in Desert Storm?,” *Airpower Journal*, Spring 1997, pp. 4, 17.

88. Existing international agreements contain a *de Martens Clause* which addresses new methods and means of warfare. It states:

> [I]n cases not included in the regulations adopted by them, the inhabitants and the belligerents remain under the protection and rule of the principles of the law of nations, as they result

> from the usages established among civilized peoples, from the laws of humanity, and dictates of the public conscience.

Preamble, 1907 Hague Convention, (IV) Respecting the Laws and Customs of War on Land. *Accord*, common article 63/62/142/158 of the Geneva Conventions of August 12, 1949; article 1(2) of the Protocol I Additional to the Geneva Convention of 12 August 1949; and, the Preamble to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which may be deemed to be Excessively Injurious or to have Indiscriminate Effects.

89. As quoted by David Shukman, *Tomorrow's War: The Threat of High-Technology Weapons*, No. 233, 1996.

90. However, it must be recognized that generally LOAC does not attempt to apportion responsibility in the context of *jus in bello.*

91. Daniel J. Boorstin, "Myths of Popular Innocence," *U.S. News & World Report*, March 4, 1991, p. 41.

92. Boorstin cites as examples the downfall of the Shah of Iran and the liberation of Eastern Europe from Soviet rule. *Ibid.*

93. John Tierney, "Our Oldest Computer, Upgraded," *New York Times Magazine*, September 28, 1997, p. 46.

94. Captain John W. Bodnar, USNR, "The Military Technical Revolution," *Naval War College Review*, Summer 1993, p. 20.

95. For a brief, even-handed analysis of the current literature regarding the democratic peace thesis, see Anne-Marie Smith, *Advances in Understanding International Peacekeeping,* U.S. Institute of Peace, 1998, pp. 30-34.

96. *Ibid.;* and Thomas Carothers, "Think Again: Democracy," *Foreign Policy*, Summer 1997, pp. 11, 14.

97. See generally, John Keegan, *The History of Warfare*, 1993.

98. Huntington's original thesis, first published in 1993, together with thoughtful critiques have been published. See Council on Foreign Relations, *The Clash of Civilizations? The Debate*, 1996.

99. Henry Kissinger, "Limits to What U.S. Can Do in Bosnia," *Washington Post*, September 22, 1997, p. 19.

100. Edward L. Rowney, a former U.S. arms control negotiator, comments:

> Our biggest mistakes stem from the assumption that others are like us, when in fact, they are more unlike than like us. We insist on ascribing to others our cultural traits, not recognizing that we have different objectives due to our unique historic backgrounds and sets of values. In short, "We fail to place ourselves in the other person's moccasins."

Edward L. Rowney, "Tough Times, Tougher Talk," *American Legion Magazine*, May 1997, pp. 24-26.

101. James W. Child, *Nuclear War: The Moral Dimension,* 1986, pp. 171-172.

102. Boorstin, *supra* note 91.

103. *As quoted by* Peter Grier, "Information Warfare," *Air Force Magazine*, March 1995, p. 35.

104. See Dennis Brack, "Do Photos Lie?," *Proceedings*, August 1996, p. 47.

105. The White House, *A National Security Strategy for a New Century*, No. 19, May 1997.

106. Sidney Axinn, contends:

> [What is] the morality of psychological warfare? When it is an effort to use the truth to gain a military goal, this type of warfare is to be accepted and applauded. When lying or "disinformation" is used, it cannot be accepted as an honorable weapon. Of course, this is quite apart from legitimate tactics to conceal information from an enemy or to mystify or fool an enemy.

See Sidney Axinn, *A Moral Military*, 1989, pp. 159-160.

107. Michael Walzer, *Just and Unjust Wars*, 2d ed., 1992, p. xvii, emphasis added.

108. See generally, Eviathar H. Ben-Zedeff, "Achilles' Heel: Feasibility of Military Censorship of the News Media in the 'Third Wave' Era of Technology," a presentation for the Biennial International Conference of the Inter-University Seminar on Armed Forces and

Society, Baltimore, MD, October 24-26, 1997, unpublished paper on file with author.

109. Douglas Waller, a *Time Magazine* correspondent observes:

> The same technology that is revolutionizing the way the Pentagon fights wars is also changing the way the media cover them. The media can now provide viewers, listeners and even readers almost instant access to a battlefield. With lighter video cameras, smaller portable computers, cellular phones, their own aircraft, and worldwide electronic linkups, the media can report on any battlefield no matter how remote and no matter how many restrictions the Defense Department tries to place on coverage.

Douglas Waller, "Public Affairs, the Media, and War in the Information Age," a presentation for the War in the Information Age Conference, Tufts University, November 15-16, 1995, unpublished paper on file with author.

110. See William J. Broad, "Private Ventures Hope for Profits on Spy Satellites," *New York Times*, February 10, 1997, p. 1.

111. Compare Bill Gertz, "Spies Use Internet to Build Files on U.S.," *Washington Times*, January 3, 1997, p. 5.

112. *Compare* Eliot Cohen, "What to Do About National Defense," *Commentary*, November 1994, pp. 21, 31. "Far more worrisome, however, is the possibility that a military fighting the shadowy battles of 'information warfare' might find itself engaging the country in foreign-policy tangles of a particularly messy kind."

113. See George C. Wilson, "Like It or Not, Space Warfare is Way of Future—and Past," *Air Force Times*, June 28, 1994, p. 70.

114. See generally, Myron Hura and Gary McCleod, *Intelligence Support and Mission Planning for Autonomous Precision-Guided Weapons*, Rand Corporation, 1992.

115. See Jennifer Heroema, "A.F. Space Chief Calls War in Space Inevitable," *Space News*, August 1-18, 1996, p. 4.

116. See William Broad, "Military Hoping to Test-Fire Laser Against Satellite," *New York Times*, September 1, 1997, p. 1.

117. W. Hays Parks, "Air War and the Law of War," No. 32, *A.F. L. Rev.,* pp. 1, 168, 1990.

118. William H. McNeill, *The Pursuit of Power*, 1982, p. 369. This is also true with respect to much of the actual technology aboard the spacecraft. See Craig Covault, "NRO Radar, Sigint Launches Readied," *Aviation Week & Space Technology*, September 1, 1997, p. 22. "The same technology employed by [the military satellites] will increasingly be applied to the commercial sector."

119. See U.S. Space Command, *Guardians of the High Frontier,* No. 16, 1996, describing military satellite systems.

120. See notes 52 and 53, *supra,* and accompanying text.

121. Jeffrey R. Barnett, *Future War: An Assessment of Aerospace Campaigns in 2010*, 1996, p. xix.

122. Essentially, the concept of proportionality requires commanders to refrain from attacks when it "may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects or combination thereof, which would be excessive in relation to the direct and concrete military advantage anticipated." See AFP 110-31, *supra* note 29, at paragraph 5-3c(1)(b)(I)(c).

123. See *U.S. Space Command Vision for 2020*, 1997, p. 6.

124. See, for example, Article I, "Treaty on Principles Governing the Activities of States in the Explorations and Use of Outer Space, Including the Moon and Other Celestial Bodies," January 27, 1967, 18 U.S.T. 2411, I.I.A.S. 6347; 610 U.N.T.S. 205, the "Outer Space Treaty." See, generally, Richard A. Morgan, "Military Uses of Commercial Communications Satellites: A New Look at the Outer Space Treaty and 'Peaceful Purposes'," No. 60, *J. Air L. & Comm.,* No. 237, Fall 1994.

125. Morgan, *Ibid.* See also Naval War College, Department of Oceans Law and Policy, *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, para. 2.9.2, note 114, 1997.

126. Among the problems with declaring space as an area of operations is the fact that there is no universally accepted definition of exactly where national sovereignty ends and "space" begins. See AFP 110-31, *supra* note 14, at para. 2-1h.

127. See Jonathan S. Landay, "The Next Arms Race? Drawing Battle Lines in Space?," *Christian Science Monitor*, December 17, 1997, pp. 1.

128. See, for example, *Hague Convention Respecting the Rights and Duties of Neutral Powers and Persons in the Case of War on Land*, 1907. Communications facilities on neutral territory are inviolate from attack so long as they are made available to all belligerents.

129. See Michael R. Mantz, *The New Sword: A Theory of Space Combat Power*, Air University Press, May 1995, p. 12, emphasis added.

130. National Science and Technology Council, *National Space Policy*, White House Press Release, September 19, 1996, pp. 6.

131. See, for example, Ben Bova, "Laser Foes Forget Crossbow's History," *USA Today*, January 7, 1998, p. 15.

132. See, generally, Commander James N. Bond, USN, *Peacetime Data Manipulation as One Aspect of Offensive Information Warfare: Questions of Legality under the United Nations Charter Article 2(4)*, Advanced Research Project, Naval War College, June 14, 1996, unpublished manuscript.

133. See Charles J. Dunlap, Jr., "Cyberattack! Are We At War?" *Journal of the National Computer Security Association*, NCSA News, November 1996, p. 19.

134. Bond, *supra* note 132.

135. See, generally, Joseph W. Cook III, Maura F. McGowan, and David P. Fiely, "Non-Lethal Weapons Technologies, Legalities, and Potential Policies," No. 5, *USAFA J. of Legal Studies,* 1994/1995, pp. 23, 38.

136. Larry Lynn, Director, U.S. Department of Defense Advanced Research Projects Agency, says that "there is no such thing as nonlethal of course." See "One on One," *Defense News*, February 19-25, 1996, p\p. 30.

137. See Cook, *et al.,* note 135, pp. 28-35.

138. See also Thomas E. Ricks, "Gingrich's Futuristic Vision for Re-Shaping the Armed Forces Worry Military Professionals," *Wall Street Journal*, February 8, 1995, pp. 16, contending that "many of the supporters of the military who lack firsthand experience . . . believe that gadgets can somehow substitute for the blood and sweat of ground combat."

139. See Lieutenant General Anthony Zinni, "No Premium on Killing," *Proceedings*, December 1996, pp. 26-28, arguing that nonlethal means should be used in tandem with lethal means.

140. A. J. Bacevich and Lawrence F. Kaplan, "The Clinton Doctrine," *The Weekly Standard*, September 30, 1996, pp. 16, 20.

141. Parks, *supra* note 48, p. 142.

142. See Best, *supra* note 21, pp. 274-275.

143. H. R. McMaster discusses a similar theme in the context of the Vietnam War in his book, *Dereliction of Duty*, 1997:

> Graduated pressure was fundamentally flawed . . . The strategy ignored the uncertainty of war and *the unpredictable psychology of an activity that involves killing, death, and destruction.* To the North Vietnamese, military action, involving as it did attacks on their forces and bombing their territory, was not simply a means of communication. Human sacrifice in war evokes strong emotions creating a dynamic that defies systems analysis quantification.

Ibid., p. 327, emphasis added.

144. A. J. Bacevich and Lawrence F. Kaplan, *supra* note 140, pp. 20-21.

145. *JV 2010*, *supra* note 16, p. 18.

146. Compare, George I. Seffers, "U.S. Army Puts Tactical Internet to Test," *Defense News*, March 17-23, 1997, p. 3, describing a battlefield information/communication system currently being tested.

147. See Captain Michael R. Lwin, USA, and Captain Mark R. Lwin, USMC, "The Future of Land Power," *U.S. Naval Institute Proceedings*, September 1997, pp. 82-83.

148. David S. Alberts, *The Unintended Consequences of Information Age Technologies*, No. 36, National Defense University, 1996.

149. *U.S. v. Calley*, 46 C.M.R. 1131, C.M.A. 1973.

150. Stephen E. Ambrose, *Americans At War*, 1997, pp. 152.

151. See Lwin and Lwin, *supra* note 147.

152. *Ibid.*

153. *Ibid.*

154. David A. Fulgham, "Computer Combat Rules Frustrate the Pentagon," *Aviation Week & Space Technology*, September 15, 1997, p. 67.

155. *Ibid.*

156. See Pat Cooper and Frank Oliveri, "Air Force Carves Operational Edge In Info Warfare," *Defense News*, August 21-27, 1995.

157. See, for example, "Generals to Moms: At Ease!," *Omaha World-Herald*, February 16, 1996, p. 6, discussing Israeli recruits arriving for training with personal cellular phones and using them to call their mothers to complain about various aspects of their military duties; and Lisa Hoffman, "E-Mail will link troops to families," *European Stars and Stripes*, December 18, 1995, p. 7.

158. As quoted in Nicholas Wade, "Bytes Make Might," *New York Times Magazine*, March 12, 1995, p. 28.

159. See, for example, Brigid Schulte, "How a Fighter Pilot's Raw Account of Rescue Flashed Around the Globe," *Philadelphia Inquirer*, July 11, 1995, describing how a private e-mail allegedly contains "explicit descriptions of radio frequencies, pilot code names, exact times and weapons load for the mission" relating to the rescue of U.S. pilot Scott O'Grady in the Balkans became available to millions on the Internet.

160. See Wade, *supra* note 158. *Ibid.*

161. John Leo, "Gadgetry's Power and Peril," *U.S. News & World Report*, April 15, 1991, pp. 20.

162. See discussion on pages 18 and 19 *supra*.

163. Martin Van Creveld, "Technology and World War II," in *The Oxford Illustrated History of Modern War*, No. 304, Charles Townsend, ed., 1997, emphasis in original.

164. Ronald Haycock and Keith Neilson, *Men, Machines, and War*, 1988, p. xi.

165. *Ibid*., pp. xii.

166. See Shukman, *supra* note 89, pp. 8. See also Michael Loescher, "New Approaches to DoD Information-Systems Acquisition" in *Cyberwar: Security, Strategy and Conflict in the Information Age*, Alan D. Campen, *et. al*., ed., 1996, p. 127, "In a world in which state-of-the-art is off-the-shelf, industry, and potentially our foes, can obtain better information systems (IS) technology cheaper and faster than DoD because our current acquisition system buys computers in the same way we buy bullets."; and Jeffery R. Barnett, *Future War*, 1996, p. 17, stressing the need to compress the procurement time for information technologies.

167. See, for example, "The Software Revolution; The Information Advantage," *The Economist*, June 10, 1995, p. 11, discussing how information technology will allow a combatant to get through the observation, orientation, decision, and action [OODA] loop faster and thus maintain the initiative.

168. See also Arsenio T. Gumahad II, "The Profession of Arms in the Information Age," *Joint Force Quarterly*, Spring 1997, pp. 14-15. "Consideration of moral and legal issues raised by information warfare has not advanced as quickly as technology and doctrine."

169. Stefan Possony and Jerry Pournelle, *The Strategy of Technology,* 1970, p. xxxi, as quoted in Chris Hables Gray, *Postmodern War*, 1997, p. 172.

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